

CLAIMS

1. An active matrix display device comprising an array of display pixels, each pixel comprising:
 - a current-driven light emitting display element (2);
 - a drive transistor (22) for driving a current through the display element (2);
 - a storage capacitor (24; C_s) for storing a voltage to be used for addressing the drive transistor (22); and
 - a light-dependent device (27) for effecting discharge of the storage capacitor in dependence on the light output of the light emitting display element (2),wherein power is provided to each pixel from a first power line (26), and wherein one of the light dependent device and the storage capacitor is coupled to a second power supply line (50), and wherein the device further comprises means for varying the voltage on the second power supply line (50) during a pixel illumination period.
2. A device as claimed in claim 1, wherein the voltage on the second power supply line (50) is ramped during a pixel illumination period.
3. A device as claimed in claim 1 or 2, wherein the light dependent device (27) comprises a discharge photodiode.
4. A device as claimed in any preceding claim, wherein each pixel further comprises an address transistor (16) connected between a data signal line (6) and an input to the pixel.
5. A device as claimed in any preceding claim, wherein the drive transistor (22) is connected between a power supply line (26) and the display element (2).

6. A device as claimed in any preceding claim, wherein each pixel further comprises an isolating transistor (17) connected in series with the drive transistor.

7. A device as claimed in any preceding claim, wherein the storage capacitor (24) is connected between the gate of the drive transistor (22) and one of the first and second power lines, and wherein the light dependent device (27) is connected between the gate of the drive transistor (22) and the other of the first and second power lines.

8. A device as claimed in claim 7, wherein the storage capacitor (24) is connected between the gate of the drive transistor (22) and the first power line (26), and the light dependent device (27) is connected between the gate of the drive transistor (22) and the second power line (50).

9. A device as claimed in claim 8, wherein the storage capacitor (24) is connected between the gate of the drive transistor (22) and the second power line, and the light dependent device (27) is connected between the gate of the drive transistor (22) and the first power line.

10. A device as claimed in any one of claims 1 to 6, further comprising a discharge transistor (36) for discharging the storage capacitor (24) thereby to switch off the drive transistor (22), and wherein the light-dependent device (27) is for controlling the timing of the operation of the discharge transistor by varying the gate voltage applied to the discharge transistor (36) in dependence on the light output of the display element (2).

11. A device as claimed in claim 10, wherein the light-dependent device (27) controls the timing of the switching of the discharge transistor (36) from an off to an on state.

12. A device as claimed in claim 10 or 11, wherein a discharge capacitor (40) is provided between the gate of the discharge transistor (36) and one of the first and second voltage lines, and the light dependent device (27) is for charging or discharging the discharge capacitor (40).

13. A device as claimed in any one of claims 10 to 12, wherein each pixel further comprises a charging transistor (34) connected between the second power line and the gate of the drive transistor (22).

14. A device as claimed in any preceding claim, wherein each pixel is adapted to draw substantially the same current from the first and second power lines (26,50).

15. A device as claimed in claim 14, wherein each pixel further comprises a current mirror circuit (90) for matching the currents drawn from the first and second power lines (26,50).

16. A method of driving an active matrix display device comprising an array of display pixels each comprising a drive transistor (22) and a current-driven light emitting display element (2), the method comprising, for each addressing of the pixel:

applying a drive voltage to an input of the pixel;

storing a voltage derived from the drive voltage on a discharge capacitor;

driving the drive transistor (22) using a voltage on a storage capacitor (24);

discharging the storage capacitor (24) using a light sensitive element, at a rate or time dependent on the light output of the display element (2), and varying a voltage on a terminal of the light sensitive element or the storage capacitor thereby to compensate for leakage currents of the light sensitive element.

17. A method as claimed in claim 16, wherein a first current is drawn by the drive transistor and a second current is drawn from said terminal of the light sensitive element or the storage capacitor, and wherein the method further comprises matching the first and second currents.